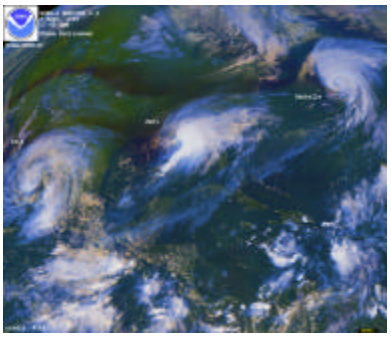
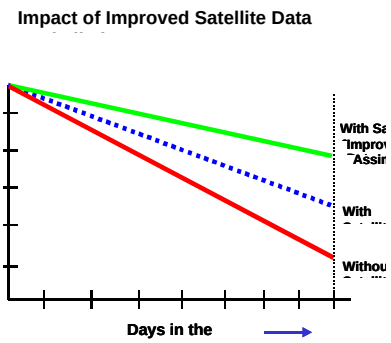
National Environmental Satellite, Data, and information Service
Joint Center for Satellite Data Assimilation



is image from GOES-8 shows ee hurricanes off the U.S. lantic coast in September 1998.



More accurate weather forecasting depends on improved satellite data assimilation

The National Requirement: The Nation has a continual need for more accurate weather forecasts that extend further into the future. Improvements directly affect the ability of our populace to prepare for severe weather, allowing protective actions to be taken to reduce the affect of hurricanes, tornadoes, floods, etc. on people and commerce. More accurate forecasts depend in large measure on being able to use all the observations being taken

NOAA's Response: Improved data; and better use of this data in the National Weather Service weather prediction models can account for substantial improvements in weather forecasting. In the next few years, the number and quality of satellite instruments will grow significantly, which will provide enhanced data capable of allowing major improvements in numerical weather prediction (NWP) model accuracy. NOAA, together with NASA, recently established the Joint Center for Data Assimilation to facilitate the use of this data by developing new and powerful mathematical techniques to assimilate the data into NWP models.

In data assimilation, conditions computed by the NWP models are compared to the data directly observed by the satellite. When they differ, model conditions are modified to match the observations and the computations are repeated. These modifications are done using powerful mathematical analysis procedures that have the effect of making the model more accurately represent the atmosphere, and provide enhanced predictions.

Satellite observations of meteorological quantities have been used in the NWP models since the 1970's. The early impact of satellite-measured variables on forecast accuracy was greatest in the Southern Hemisphere where there are many fewer conventional weather observations and weather stations. Satellites filled the Southern Hemisphere data void and immediately improved the forecasts in this region. The largest improvement in Northern Hemisphere weather forecasting accuracy occurred when weather forecasters began the direct assimilation of satellite infrared sounder radiances into the global model. Direct assimilation of satellite microwave data, which took place within a year of the NOAA-15 launch in 1998 also had a major impact on the forecast accuracy. Much work remains to fully utilize our present and planned satellite investments.

Financing: The FY 2002 President's Budget includes $750 thousand for the Joint Center for Satellite Data Assimilation within the request for Environmental Observing Services, an increase of $750 thousand over the FY 2001 enacted nding level. The funding will accelerate the use of current and future satellite ıta, and will result in productivity increases by decreasing the average time from /o years to one year for implementing data from new satellite technology into ıNOAA operations.